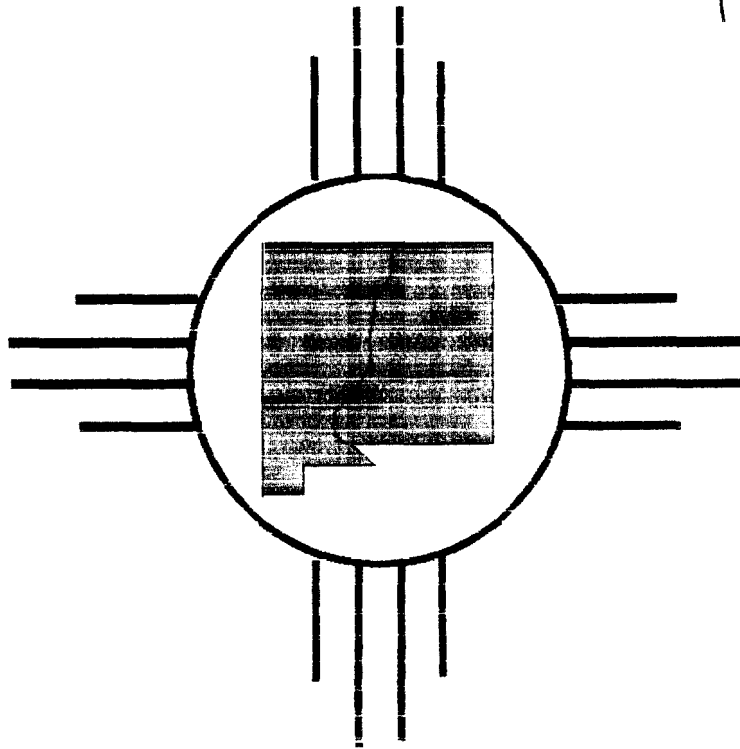


PR 93-86



PUBLIC SAFETY RADIO COMMUNICATIONS PLAN

for

THE STATE OF NEW MEXICO

**** REGION 29 ****



BRUCE KING
GOVERNOR

Laura E. Threet
SECRETARY

Leo Griego
DEPUTY SECRETARY

STATE OF NEW MEXICO
GENERAL SERVICES DEPARTMENT
INFORMATION SYSTEMS DIVISION
RADIO COMMUNICATIONS BUREAU
PO Box 5393, Coronado Station
Santa Fe, New Mexico 87502-5393
(505) 827-9351

OFFICE of the SECRETARY
(505) 827-2000
ADMINISTRATIVE SERVICES DIVISION
(505) 827-2165
BUILDING SERVICES DIVISION
(505) 827-2349
INFORMATION SYSTEMS DIVISION
(505) 827-2001
PROPERTY CONTROL DIVISION
(505) 827-2141
PURCHASING DIVISION
(505) 827-0472
RISK MANAGEMENT DIVISION
(505) 827-0442

RECEIVED

PUBLIC SAFETY REGIONAL PLANNING COMMITTEE
IRVING W. SKINNER, CHAIRMAN
THE STATE OF NEW MEXICO
REGION 29

FEB - 4 1993
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

IRVING W. SKINNER was elected chairman of the New Mexico Region 29
800 Mhz Planning Committee at our first Convenor meeting.

Mr. Skinner works for the State of New Mexico. Radio Communications



BRUCE KING

GOVERNOR

Laura E. Threet

SECRETARY

Leo Griego

DEPUTY SECRETARY

STATE OF NEW MEXICO

GENERAL SERVICES DEPARTMENT
INFORMATION SYSTEMS DIVISION
RADIO COMMUNICATIONS BUREAU

PO Box 5393, Coronado Station
Santa Fe, New Mexico 87502-5393
(505) 827-9351

OFFICE of the SECRETARY
(505) 827-2000

ADMINISTRATIVE SERVICES DIVISION
(505) 827-2165

BUILDING SERVICES DIVISION
(505) 827-2349

INFORMATION SYSTEMS DIVISION
(505) 827-2001

PROPERTY CONTROL DIVISION
(505) 827-2141

PURCHASING DIVISION
(505) 827-0472

RISK MANAGEMENT DIVISION
(505) 827-0442

RECEIVED

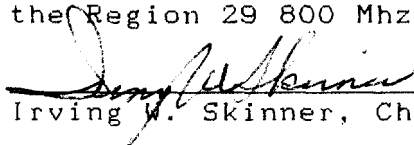
PUBLIC SAFETY REGIONAL PLANNING COMMITTEE
IRVING W. SKINNER, CHAIRMAN
THE STATE OF NEW MEXICO
REGION 29

FEB - 4 1993

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

FINAL REVIEW COMMITTEE

I, Irving W. Skinner, Chairman of the State of New Mexico Region 29 800 Mhz Planning Committee, do hereby indicate by my signature that the Final Review Committee completed its review and accepted the Region 29 800 Mhz Plan on November 23, 1992.


Irving W. Skinner, Chairman



BRUCE KING
GOVERNOR

Laura E. Threet
SECRETARY

Leo Griego
DEPUTY SECRETARY

STATE OF NEW MEXICO
GENERAL SERVICES DEPARTMENT
INFORMATION SYSTEMS DIVISION
RADIO COMMUNICATIONS BUREAU
PO Box 5393, Coronado Station
Santa Fe, New Mexico 87502-5393
(505) 827-9351

OFFICE of the SECRETARY
(505) 827-2000
ADMINISTRATIVE SERVICES DIVISION
(505) 827-2165
BUILDING SERVICES DIVISION
(505) 827-2349
INFORMATION SYSTEMS DIVISION
(505) 827-2001
PROPERTY CONTROL DIVISION
(505) 827-2141
PURCHASING DIVISION
(505) 827-0472
RISK MANAGEMENT DIVISION
(505) 827-0442

PUBLIC SAFETY REGIONAL PLANNING COMMITTEE
IRVING W. SKINNER, CHAIRMAN
THE STATE OF NEW MEXICO
REGION 29

RECEIVED

FEB - 4 1993

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

ACKNOWLEDGMENTS

I would like to thank John Dawson, Acting Deputy Director of the Office of Communications for his support during the time it took to complete this plan. I would, also like to thank all the people who contributed the technical information and maps I had drawn up to cover the plan and most of all, the Planning Committee/NM APCO chapter for standing behind me during my illness for these past three years.

REGIONAL PLANNING COMMITTEE REQUIREMENTS
AS OUTLINED IN THE NPSPAC'S FINAL REPORT
1988

Executive Summary:

1. The traditional mileage separation approach for frequency reuse must not be considered the best approach to maximize reuse of the 800MHz Public Safety channels. The question of frequency reuse criteria will be addressed at the Regional planning level.
2. Planning for re-assignment of Public Safety frequencies that are relinquished by the user as a result of the implementation of 800MHz systems must be done at the Regional Planning level.
3. Regional Plans may identify additional common channels for use within there respective Regions.
4. Each licensee or agency using frequencies in this portion of the Public safety spectrum should, at a minimum, incorporate the National Public Safety Calling Channel for interoperability. Regional Plans must address the use of these frequencies.
5. Regional Plans must require, where practicable, that Public Safety agencies within a given political jurisdiction or sub-division are to utilize common systems.
6. Federal agencies interoperability needs must be included in the communications requirements of Regional Planning.
7. Digital Voice Encryption must be addressed in Regional Plans.

Report Summary:

1. It is recommended that Regional Plans incorporate techniques for interfacing the use of Amateur Radio, Satellite communications, long range Emergency Communications into the Regional Plans.
2. To what extent should 800MHz Public Safety Radio systems be interconnected to switched telephone networks. should the Regional Plan even consider this matter?
3. Cellular car and hand held telephones, which can relieve Public Safety non-critical communications traffic must be considered by Regional Planners.
4. The American Red Cross and other quasi-public sector

Report Summary: page (2)

entities recognized for their contribution to disaster management and relief must be considered.

5. To meet the need of interoperability between Federal, State, and/or local governments during daily and disaster management operations, S-160 type agreements must be strongly urged by Regional Planners. (letters of agreement)
6. It is recommended that a factor be considered in the anticipated traffic requirement of non-Federal communications systems to accommodate present and future Federal interoperability needs.
7. Regional Plans must manage the five channel pairs established on 800MHz for mutual aid and interoperability
8. The Regional Plan must address Federal level interoperability on the five interoperability channels. It is recommended that use be restricted for daily use of local and regional interoperability needs and Federal use for tactical operations.
9. One of the five channels will be designated as the National Public Safety Calling Channel, with the remaining four channels designated as tactical channels. The Regional Plan must identify their operation and management specifically.
10. Regional Plans can identify additional mutual aid channels and must provide operational guidelines for their use. This pertains to all Public Safety spectrum as well as 800MHz.
11. Any additional common channels identified in the Regional Plans should be located as specified in the respective Regional Plans, and need not be protected by the bandwidth criteria of the National Common Channels.
12. All primary Public Safety dispatch centers, designated in the Regional Plan, must operate a base station on the National Public Safety Calling Channel and maintain a radio watch. The Regional Plan must determine the normal mode of operation of common channel base stations (repeat or repeat disable).
13. The Regional Plan must address the use of digital voice encryption and take this need into consideration in developing frequency-specific plans.
14. In order to provide state-of-the-art technology to entities of all sizes, spectrum efficiency, and budgetary

Report Summary: page (3)

resources for meeting increased public demand, Regional Plans are to require, where practical, users within a given political sub-division and users of adjacent political sub-divisions, to utilize joint or common systems.

15. Regional Plans must include the Public Safety communications needs of all current eligibles such as Public Works, Highway Maintenance, Forestry-Conservation, Local Government, Fire and Police. Additional Regional Plans must include such other Public Safety service associated operations as is deemed necessary and desirable for local regional needs

Report Summary: page (4)

21. The Regional Plan Review Committee must be responsible for providing full Public Safety representation to resolve intra-region problems. The Region, however, must name one spokesperson to represent its interests in

Report Summary: page (5)

24. Specific direction as to frequency give up will be spelled out in the Regional Plan. Specific planning, as a part of the Regional effort must be agreed to between various entities involved in system expansion where other frequency bands are involved.

Summary Addendum

Interoperability for Federal, State, Pueblos, Reservations and Local Government Agencies will require to submit a letter to the APCO Frequency Advisor for operation on the Five Common Channels. When they wish to operate on other agency frequency (frequencies) then they will go to the individual agencies.

Address for Region 29 State of New Mexico:

State of New Mexico
APCO Frequency Advisor
Attn: Irving Skinner
P.O. Box 5393
Santa Fe, NM 87502

PUBLIC SAFETY RADIO COMMUNICATIONS PLAN

FOR

THE STATE OF NEW MEXICO

* REGION 29 *

TABLE OF CONTENTS

| | | |
|-----|---|----|
| 1.0 | SCOPE | |
| 1.1 | Introduction..... | 5 |
| 1.2 | Purpose..... | 6 |
| 2.0 | AUTHORITY | |
| 2.1 | Regional Planning Committee..... | 6 |
| 2.2 | Planning Committee Formation..... | 8 |
| 2.3 | National Interrelationships..... | 9 |
| 2.4 | Federal Interoperability..... | 9 |
| 2.5 | Regional Review Committee..... | 10 |
| 3.0 | SPECTRUM UTILIZATION | |
| 3.1 | Region Defined..... | 11 |
| 3.2 | Region Profile (Demographic Information)..... | 12 |

| | | |
|-----------|---|----|
| 3.5 | Initial Spectrum Allocation..... | 22 |
| 3.5.1 | Frequency Sorting Methodology..... | 22 |
| 3.5.2 | Geographic Area..... | 23 |
| 3.5.3 | Define the Environment..... | 23 |
| 3.5.4 | Blocked Channels..... | 23 |
| 3.5.5 | Transmitter Combining..... | 24 |
| 3.5.6 | Special Considerations..... | 24 |
| 3.5.7 | Protection Ratios..... | 25 |
| 3.5.8 | Adjacent Region Considerations..... | 25 |
| 4.0 | COMMUNICATIONS REQUIREMENTS | |
| 4.1 | Common Channel Implementation..... | 25 |
| 4.1.1 | Areas of Operation..... | 27 |
| 4.1.2 | Operation on the Common Channels..... | 27 |
| 4.1.3 | Operation Procedures..... | 28 |
| 4.1.3(I) | International Calling Channel (ICALL)..... | 28 |
| 4.1.3(II) | International Tactical Channels (ITAC-1 Through ITAC-4)..... | 28 |
| 4.1.4 | Coded Squelch..... | 29 |
| 4.2 | Network Operating Method..... | 29 |
| 4.3 | Requirements For Trunking..... | 30 |
| 4.4 | Channel Loading Requirements..... | 32 |
| 4.4.1 | Loading Tables..... | 33 |
| 4.4.2 | Traffic Loading Study..... | 34 |
| 4.4.3 | Slow Growth..... | 34 |
| 4.5 | Use of Long Range Communications..... | 34 |
| 4.6 | Expansion of Existing Systems..... | 35 |

| | | |
|-------|--|----|
| 5.0 | IMPLEMENTATION AND PROCEDURES | |
| 5.1 | Notification..... | 35 |
| 5.2 | Frequency Allocation Process..... | 37 |
| 5.3 | Frequency Allocation Maps..... | 37 |
| 5.4 | State Map..... | 37 |
| 5.5 | Excluded Common Channels..... | 38 |
| 5.5.1 | Excluded Channels for Mexico(90.619(2))..... | 39 |
| 5.5.2 | Channel Assignments by County..... | 44 |
| 5.5.3 | Channel Assignments for Major Towns & Cities..... | 46 |
| 5.5.4 | Channel Assignments for Reservtions and Pueblos..... | 47 |
| 5.5.5 | Channel Assignments for The State of New Mexico..... | 48 |
| 5.5.6 | Channel Assignments for Government Agencies..... | 52 |
| 5.6 | Assignment Statistics..... | 53 |
| 5.7 | Expansion of Initial Allocation..... | 54 |
| 5.8 | Prioritization of Applicants..... | 54 |
| 5.9 | Appeal Process..... | 54 |
| 6.0 | THE REGIONAL PLANNING COMMITTEE | 55 |

1.0 SCOPE

1.1 Introduction

In December of 1983, the United States Congress directed the Federal Communications Commission (FCC) to establish a plan to ensure that the communications needs of state and local public safety authorities would be met. By their regular means of initiation, the FCC began the process of developing such a plan. Through their efforts, and the efforts of the National Public Safety Planning Advisory Committee (NPSPAC) the plan was begun. The National Public Safety Planning Advisory Committee provided an opportunity for the public safety community and other interested members of the public to participate in an overall spectrum management approach by recommending policy guidelines, technical standards, and procedures to satisfy public safety needs for the foreseeable future. After consideration of NPSPAC's Final Report and comments filed in Docket No. 87-112, a Report and Order was released by the FCC in December 1987, which established a structure for the National Plan that consists of guidelines for the development of regional plans. The National Plan provides guidelines for the development of regional plans. The particulars of this plan are found in FCC 87-359, which contains the required steps and contents for regional plan development. It is on this document that this plan is developed.

1.2 Purpose

Public safety communications has, for many years, been inadequate throughout the United States. This is as true for New Mexico as it is for any other state. Many, if not all, public safety radio users are constantly bombarded with outside interference, noise, and over crowding. It is with these problems in mind that this plan was developed.

This regional plan was developed with the objective of assuring all levels of public safety/public service agencies that radio communications in the near and distant future will not suffer from the problems of the past. The allocation of frequencies was done in as equitable a way as possible. The goal was to supply a pool of frequencies for each county and a pool for state agency use with adequate reserve allocations for future needs in all areas, and a method to appeal initial allocations based on need. The National Plan, as developed by NPSPAC, was followed very closely in most considerations for frequency allocation, re-use, turn back, regional interoperability, spectrum requirements and adjacent region operations. This plan should provide the flexibility to accommodate the growth and changes which are bound to occur in public safety and public service communications operations long into the future.

2.0 AUTHORITY

2.1 Regional Planning Committee

The development of the Public-Safety Radio Communications Plan for Region 29, the State of New Mexico, has followed the

2.1 Regional Planning Committee (cont)

requirements of the FCC's Report and Order as issued in the matter of General Docket 87-112.

In accordance with the FCC's Report and Order 87-112, the Associated Public-Safety Communications Officers Inc. (APCO) recommended to the Commission the appointment of a "Convenor" for New Mexico Region 29. The Convenor served as the coordinator for the assembly and formation of the planning committee.

Participants in the formation of the Regional Planning Committee represent interested parties from both the Public Safety and Special Emergency Radio Services. A total of 18 individuals have participated in the development process. The list herein contains the names, organizational affiliations, mailing addresses and phone numbers of all participants in the Regional Planning Committee.

The committee was selected by attendance at the planning meetings. Each member of the Committee representing an eligible licensee under the Public Safety Radio Services and the Special Emergency Radio Services was entitled to one vote in all Committee matters. Except as may be provided elsewhere in the Plan, the majority of those present at a scheduled meeting constituted a majority for all Public Safety Radio Users and the Special Emergency Users. Only the final approval of the plan prior to submission to the FCC required a vote from more than would be in attendance at a regular meeting. In this case the vote was conducted by mail ballot sent to all those who had not

2.1 Regional Planning Committee (cont)

participated in the planning process. This way, the finished plan was reviewed and accepted by the widest, within reason, group of public safety/public service users.

2.2 Planning Committee Formation

The process of forming the Planning Committee was conducted in the following steps:

1. Personal interviews were held (on the telephone) with the representatives of all major state, county, cities and Indian government agency radio users.
2. Presentations concerning the requirements for a regional planning committee were presented and discussed at state organization meetings. At each presentation there was an opportunity for persons to place themselves and/or their agency on the mailing list.
3. Letters of announcement were mailed to each major state organizations composed of local government level public safety/public service users. Letters were also sent to all members of the New Mexico Chapter of APCO.
4. A public notice was placed in a FCC PUBLIC NOTICE for the first planning committee meeting. This first meeting was held at the High Mesa Inn in Santa Fe, a public facility. (See Appendix A).
5. One organizational meeting was held before the chairperson was elected.
6. Committee membership was left open to any person or agency

2.2 Planning Committee Formation (cont)

which may not have been notified or decided to join the committee later.

7. Vendors participation was encouraged, but vendors were not allowed a vote.

2.3 National Interrelationships

The Regional Plan is in conformity with the National Plan. If there is a conflict between the two plans, the National Plan will govern. It is expected that Regional Plans for other areas of the country may differ from this plan due to the broad differences in circumstance, geography, and population density.

By officially sanctioning this plan the Federal Communications Commission agrees to its conformity to the National Plan. Nothing in the Plan is to interfere with the proper functions and duties of the organizations appointed by the FCC for frequency coordination in the Private Land Mobile Radio Services, but rather it provides procedures that are the consensus of the Public Safety Radio Services and Special Emergency Radio Service user agencies in this Region. If there is a perceived conflict then the judgment of the FCC will prevail.

2.4 Federal Interoperability

Interoperability between the Federal, State and Local Governments during both daily and disaster operations will primarily take place on the five common channels identified in the National Plan. Additionally, Region 29 will need a letter of request to the user agency, a licensee may permit Federal use of a non-

2.4 Federal Interoperability (cont)

communications system. Such use, on other than the five identified common channels, is to be in full compliance with FCC requirements for government use of non-government frequencies (Title 47 CFR, sec 2.103). It is permissible for a non-Federal government licensee to increase channel requirements to account for 2-10 percent increase in mobile units, dependent on the amount of Federal Government Agencies involvement in its area, provided that written documentation from Federal agencies supports at least that number of increased units.

2.5 Regional Review Committee

Upon approval of this Plan by the Federal Communications Commission, a Region 29 Review Committee will be established for the review of applications which do not fall within the stated guidelines provided for in this plan, or for the settlement of disputes concerning this plan and/or its application.

This committee shall consist of the Local APCO Frequency Advisor for this region, a state agency representative, one representative from the Police, Fire and EMS services, and a minimum representation from other eligibles is also welcome. This

~~Committee and its composition will be approved by the New Mexico~~

2.5 Regional Review Committee (cont)

demands will outpace available spectrum. Each member of the committee shall be furnished a copy of this plan upon their appointment or election to the committee.

Plan updates shall be accomplished by this committee. All changes or updates to the plan shall be first agreed upon by this committee and then submitted to the FCC for their review and consideration. When approved all changes shall be added to the plan with the appropriate documentation of approval.

This committee shall meet at least once annually to review the implementation of the plan. This review shall consist of examination of any and all license activity.

3.0 SPECTRUM UTILIZATION

This portion of the Plan provides a basis for proper spectrum utilization. Its purpose is to guide the Local APCO Frequency Advisor and/or the Regional Review Committee in their task of evaluating the implementation of this plan within this Region.

3.1 Region Defined

Region 29 is the State of New Mexico. This region is the result of definition by the Federal Communications Commission as a result of recommendations made in the National Public Safety Planning Advisory Committee (NPSPAC) plan as submitted and approved and contained in Docket 87-112. For purposes of this plan the State of New Mexico shall be defined as all the lands and waters contained within the boundaries of the State of New Mexico.

3.2 Region Profile (Demographic Information)

The purpose of this section is to provide the basis for the assignment of frequencies, and their re-use. Since region 29 serves the mountainous area of New Mexico and bordered on west by Arizona, north by Utah, Colorado, East by Oklahoma, Kansas, Texas and south by Mexico. With elevations ranging from 3000ft to over 13000ft. Signal paths vary to a tremendous degree due to this topography. It is common to place radio stations on top of these

3.2.2 Geographical Description (cont)

state. This presents considerable problems in area coverage for

3.3 Usage Guidelines (cont)

The next level of communication coverage will be a county/multiple municipality area. Those systems that are designed to provide area communication coverage must demonstrate their need to require such wide area coverage.

This would apply in a situation such as a city requesting coverage of an entire county. Communication coverage beyond the bounds of a jurisdictional area of concern cannot be tolerated unless it is critical to the protection of life and property. If the 800 MHz trunked radio technology is utilized, the system design must include as many county/multiple municipality government public safety and public service radio users as can be managed technically.

The county/multiple municipality agency(ies), depending upon systems loading and the need for multiple systems within an area, must provide intercommunications between area-wide systems. In a multi-agency environment, a lead agency using the 800 MHz spectrum, which is an agency or organization having primary response obligations in the geographic area, shall be responsible for coordinating the implementation of the Common Channels in this band as mandated by the National Plan. Such implementation must be reviewed and approved by the Local APCO Frequency Advisor, and at his/her discretion, the Regional Review Committee.

Municipal terminology often differs. In order to provide a title for the next level of communications the term metropolitan is used to define the level below county-wide. Metropolitan

3.3 Usage Guidelines (cont)

communications for public safety and public services purposes must provide only the communications needed within its boundaries. However, if the total number of radios in service does not reach minimum loading criteria for a trunked system, they must consider utilizing the next higher system level if 800 MHz trunked radio is available in the area. As those higher level systems reach capacity, the smaller system communicators in public safety and public service must then consider uniting their communications efforts to formulate one large system or forfeit use of the limited 800 MHz spectrum.

Where smaller conventional 800 MHz needs are requested, those frequencies to be utilized must not interfere with the region's trunked systems. The 800 MHz trunked radio system is to be considered the higher technology at this time and in greater compliance with FCC guidelines. The amount of interference that can be tolerated depends on the service affected. Personal life and property protection shall receive the highest priority and disruptive interference with communications involved in these services in an area shall not be tolerated. Any co-channel interference within an authorized area of coverage will be examined on a case by case basis by the Regional Review Committee.

3.4 TECHNICAL DESIGN REQUIREMENTS FOR LICENSING

3.4.1 Definition of Coverage Area or Area of Jurisdiction

The coverage area shall be that area for which a system is intended to cover with a received signal strength of greater than 40 dBu. This area shall normally represent the boundaries of the County or the incorporated municipality which is applying for license. In the case of regional or area-wide, multi-jurisdictional systems, the coverage shall be that area of all jurisdictions participating in the system combined.

3.4.2 System Coverage Limitations

System coverage shall be limited to the coverage area defined as listed above plus no more than five (5) additional miles in all directions extending from said boundaries of definition. This limitation shall assure maximum frequency reuse. The only exception to this rule shall be those applicants wishing to offer service or system use to areas outside of their jurisdictional boundaries. In these situations the applicant shall provide a proposal of said service to the Local APCO Frequency Advisor, who may request Regional Review Committee consideration, for approval.

Systems not located within the geographical center of the jurisdiction(s) for which they cover shall utilize either directional antennas or antenna/tower relationship techniques to achieve the coverage required by this plan.

3.4.3 Determination Of Coverage

There are four variables used in determining the area of coverage